REMR TECHNICAL NOTE CS-MR-4.1

APPLYING COLORLESS COATINGS TO BRICK MASONRY*

PURPOSE: To describe the use of colorless coatings to improve the performance of brick masonry.

APPLICATION: Correcting performance problems such as moisture penetration or the occurrence of efflorescence salts on brick masonry walls.

ADVANTAGES: Provides a means of remedial action for recurring poor-performance brick masonry walls that is inexpensive and not time-consuming. Applications of coatings do not require extensive structural rearrangement, renovation, or repair.

LIMITATIONS: There are several limitations inherent in the use of colorless coatings:

a. Disadvantages which may often cause more harm than good include:

   1. Indiscriminate use of such coatings will not stop moisture penetration through cracks or incompletely filled joints.

   2. They may contribute to spalling and disintegration of the brick units by causing crystalline deposits of salts to form within the unit.

   3. Staining or efflorescence will not be completely stopped, but may be covered sufficiently to prevent its removal.

   4. They could make the wall nearly impossible to tuck-point, if required.

b. Their use does not guarantee satisfactory performance of the brick masonry wall but will greatly enhance the probability thereof.

c. The following list of cautions must be adhered to:

   1. All obvious cracks, poorly filled mortar joints, and other openings in face of the brick masonry must be cut out to a depth of 3/8 to 1/2 in. and properly tuck-pointed with a suitable prehydrated mortar.

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* This technical note is largely based on "Colorless Coatings for Brick Masonry," Technical Notes on Brick Construction No. 7E, Sept/Oct 1976, Brick Institute of America, McLean, VA.

2. All windows, copings, sills, and other joints between brick masonry and other materials must be cleaned, primed, and caulked with a good grade of elastic sealant, e.g. silicone-rubber, polysulfide base, etc.

3. There should be no efflorescence, or at most only a minor occurrence of efflorescence, on the brick masonry to be treated.

4. The brick units from which the wall is constructed must be of excellent quality. If not, they may suffer spalling or disintegration. It is suggested that extruded units be of grade SW without waivers permitted in the specifications, and molded or dry press units be of grade SW in accordance with the specifications. In addition, the units should be essentially free of face cracks, checks, or other damage before any treatment.

5. The wall must be fairly clean and dry at the time of application. Heavy coatings of city dirt and dampness will interfere with proper penetration of the sealer solution and result in poor performance and shorter life.

6. The sealer material should be that of a reputable manufacturer. It is suggested that a product be used that has a good track record over a period of at least 5 years.

7. The sealer material should contain not less than 5 percent solids; over 7 percent is preferable. Solvent-based sealers are strongly recommended as opposed to water-based sealers, because the molecular structure is smaller, the penetration will be better, and the application, therefore, will last longer and perform better.

8. The selected sealer candidates should be applied to test panels on the building at a suitable location that is reasonably hidden. The test panels should be allowed to cure and weather for several months and then be inspected to determine satisfactory performance as to color change, water permeability, etc.

9. It is suggested that the owner or architect require a written warranty from the contractor performing the work and the sealer manufacturer as to precisely what work is being performed and what the results will be over a specified period of time.

10. Water vapor permeance (breathability) is considered to be a desirable quality in a coating as it allows moisture in the brick masonry to escape. Some coatings do not allow water vapor to escape at all or to escape at a reasonable rate and can cause damage from freezing and thawing or failure of the coating because of loss of bond to the surface.

d. Retreatment will be required periodically, probably in 3 to 7 years although some specific solutions will last longer.

AVAILABILITY: The colorless coatings discussed in this technical note can be purchased at local hardware stores. Recommendations for their use, based on many years of experience and study, are available from the Brick Masonry Institute of America (1750 Old Meadow Road, McLean, VA 22101). For their use, the forms in which they are available should be considered as outlined in this section. Clear exterior masonry wall applications fall into several broad material groups; e.g., silicones, silanes, siloxanes, stearates, gum waxes, acrylics, resins, rosins, rubbers, paraffins, butyls, oils, other polymers, and various combinations thereof. Although, usually called "water-proofers," they are not. They are water repellents; i.e., their application will change the capillary angle of the pores in the face of the masonry wall from positive (suction) to negative (repellency). In addition, they will not, in the percentage strengths normally used, bridge or fill hairline cracks or separations in the face of brick masonry walls. These hairline cracks, separations, and poorly filled mortar joints are usually the principal source of moisture penetration and resulting efflorescence.

In general these materials are available in two types of solutions: water-based solutions and solvent-based solutions. In nearly all instances, better penetration and better performance are attained using solvent-based solutions.

It should be stated, however, that when the proper types of these materials are properly applied under the right conditions, they will perform quite satisfactorily.

COSTS: Initial application costs for the use of colorless coatings are about 15 percent of the costs of tuck-pointing. However, colorless coatings must be applied periodically.

BACKGROUND: The successful performance of brick masonry walls depends upon careful attention to three facets of the design and construction:

a. Design. Selection of a suitable wall type and proper design and attention to details such as flashing, weep holes, coping, etc., so that the wall will function as intended.

b. Materials. Selection of quality materials including brick, mortar, flashing, and ties.

c. Workmanship. Execution of excellent workmanship characterized by the complete filling of all joints intended to receive mortar, their correct tooling, the proper installation of the flashing and weep holes as detailed, and a carefully executed clean-down procedure. Necessary parts of the workmanship, which are sometimes overlooked, are the careful batching of the mortar, proper storage of the materials, and protection of the masonry work while it is under construction.

The results of careful attention to these details will be masonry that is durable, strong, resistant to rain penetration, and possesses the expected performance properties. Each of these elements is essential to satisfactory performance. Quality materials and quality workmanship will not compensate for poor design and detailing, and obviously no design can compensate for poor workmanship or materials.

These three essential elements for successful performance all too often are not achieved. The results are brick masonry walls that have performance problems of the types being discussed in this technical note. There is a broad school of thought that believes in and recommends the use of colorless liquid applications as waterproofers or water repellents to the brick masonry to solve these problems. The indiscriminate use of these colorless coatings should be avoided.

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